A ropemaker for more than forty years, Pete Schmidt, of the Plymouth Cordage Company, says: "A splice is stronger than the rope itself. I don't bother much with knots." That oversize darning needle he is using is a fid, the splicer's best friend.

SATURDAY EVENING POST
DECEMBER 7, 1946

The Patient Spinners of Plymouth

By ARTHUR W. BAUM

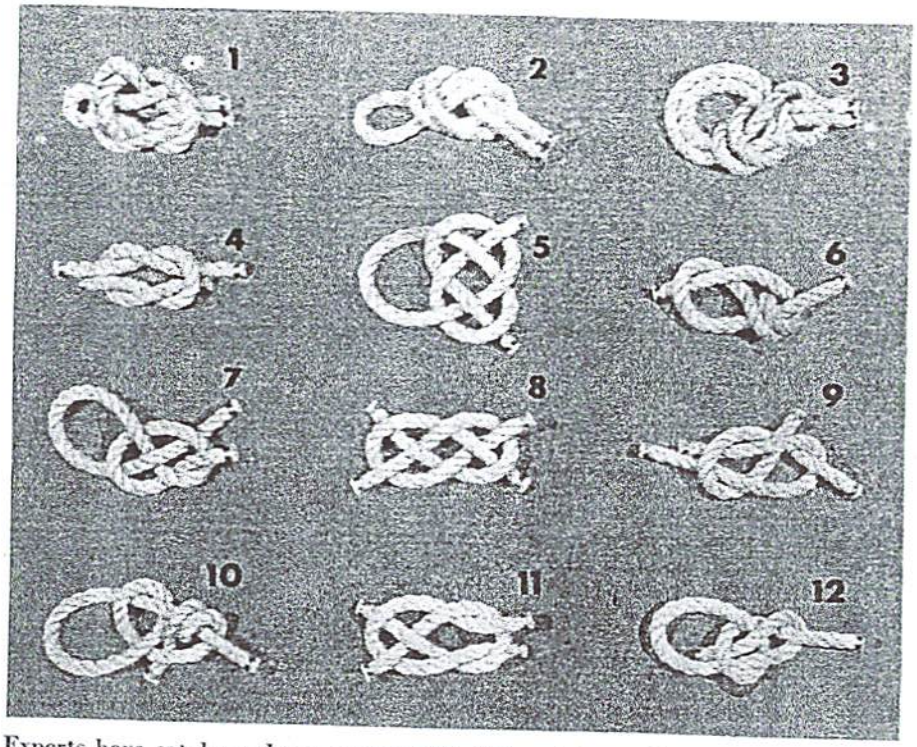
Do you take rope for granted, think of it as merely a handy thing to have around when you happen to want it? There's a lot more to it than that, as this story of an aged and modest New England ropemaker demonstrates.

A STRANGER popped up one day at Plymouth, Massachusetts, and approached a local corporation with an idea for a product of overwhelming merit. This thing, the caller stated flatly, was tremendous. Every adult citizen and most adolescents would want one, the local company could make it, and for a mere $100,000 or so he would let them in on it right then and there. In case anyone had missed the point, he repeated himself. He said it was terrific.

The local people took a conventionally bleak New England view of the offer, gently hinting that the first step in a dicker was to have a look at the sow in the poke. The stubborn visitor, on the contrary, insisted that they sign and conclude first, and the situation showed evidence of hardening. Things ran on without progress, the stranger hanging about town for several days, getting in some good looks at Plymouth Rock and Pilgrim landmarks, and at intervals returning to the manufacturer to reopen the deal on a somewhat reduced level. *(Continued on Page 86)*

PHOTOGRAPHY BY PINTO

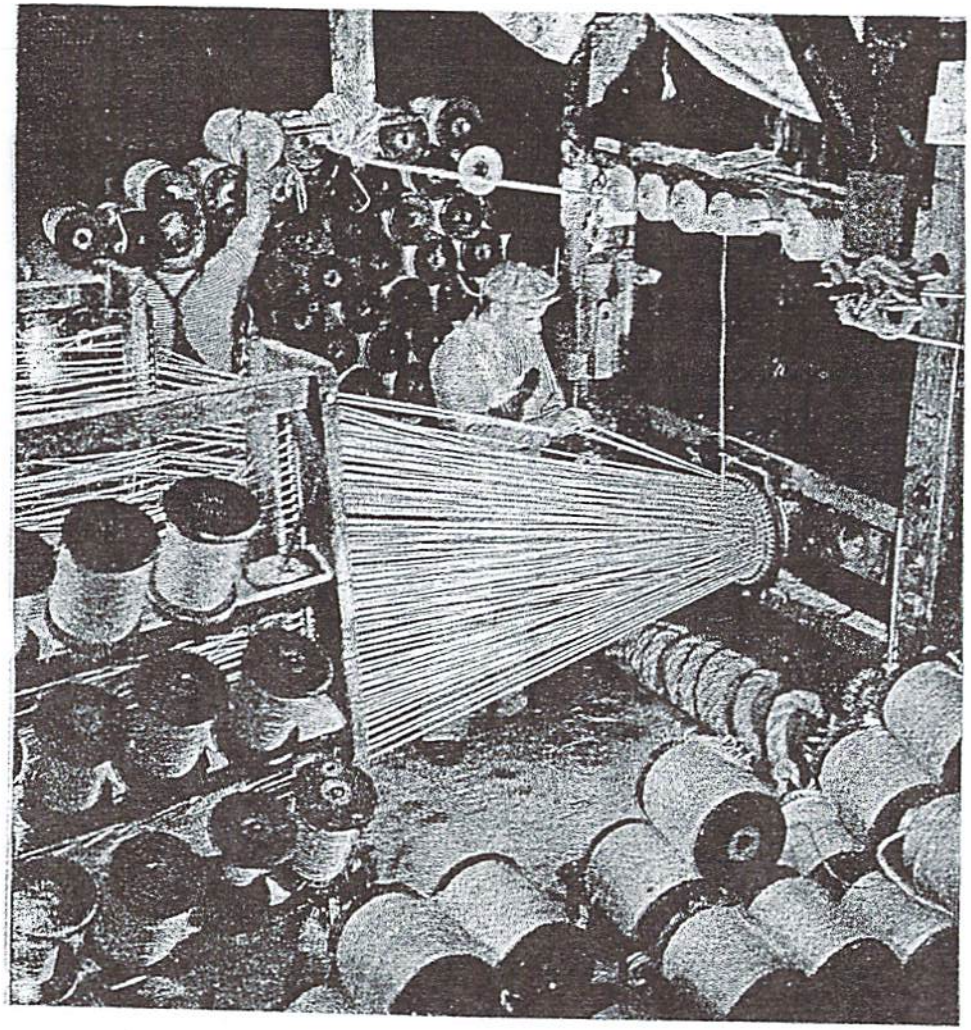
A sliver uncoiling from second breaker. This sisal fiber has been combed and recombed so the long fibers will parallel one another.



Experts have catalogued as many as 3900 different knots, but you can probably get along if you master the dozen shown above. 1. Jar Sling; 2. Overhand Loop; 3. Bowline on a Bight; 4. Square or Reef Knot; 5. Gunner's Knot; 6. Stevedore Knot; 7. Bathrobe Cord Knot; 8. Double Carrick Bend; 9. Weaver's Knot; 10. Midshipman's Hitch; 11. Single Carrick Bend; 12. the famous and useful Bowline.

At a ship chandler's shop in Boston, fisherman Basil Doucett appraises a new line, while salesman Herbert Green shows better sense than to try to tell a fisherman anything about rope. Seafarers still consume more rope than any other occupational group.

Yarns are spun, strands are formed, rope is laid. The streams of fiber unrolling from bobbins are yarns entering former, which forms them into strands.



As soft as Goldilocks' hair. Oiled fibers are fed into a draw frame. After loose fibers are combed, they are spun, spun again, finally spun into rope.

Saturday Evening Post
December 7, 1946

THE PATIENT SPINNERS OF PLYMOUTH

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Ultimately the stranger conceded that although this thing was unquestionably terrific, he was ready to unveil it for the price of a railroad ticket out of town, and he did.

It turned out to be a flexible, contour-conforming back scratcher. You made it this way, he said: you took a piece of rope about as long as a bath towel and tied a knot, preferably a monkey's fist, in the middle. With such a device slung across a body's back, one end in each hand, the monkey's fist could be made to massage any itchy spot between any human shoulder blades—and did the company ever hear of anyone whose back, at one time or another, failed to itch at a precisely inaccessible spot?

Although the great idea unhappily never came to anything, the stranger had two incontestable points. Backs do need scratching. And the company he approached, the Plymouth Cordage Company, made rope. In fact, Plymouth Cordage has made more rope than anyone else in this country, having been at it for 122 years, and for some time has felt pretty sure that it was the largest ropemaker in the world.

Making more rope than anyone else strikes the Plymouth people as a very pleasant thing indeed. "The Cordage," as they call the company around the town of Plymouth, finds rope an exciting product. Cordage people unconsciously give off the impression that the way to control the atom is to lash it down with good stout Manila hemp. Which, incidentally, is not hemp at all, but *abacá*, the fiber of a wild banana plant. After that, we can all turn with easy minds to the more important things in life, such as the several thousand ways of using good rope, including the more than 400 uses listed by the War Production Board as justifiably critical during the war, when rope fibers were exceedingly scarce.

The business of making more rope than anybody else is not particularly gigantic, but it is sizable. Plymouth Cordage is by far the largest industry in Plymouth and owns a great share of the land in the community of North Plymouth. Its factory buildings cover about thirty-three acres and fit nicely into the Plymouth background, which has a patina of three centuries softening it in a neat green-and-white New England way. About 1100 people are involved in making cordage here, the main plant of four in the United States and Canada, and the out-turn equals three feet of rope alone for every American every year. During the war, production in dollars was about twice prewar, or $20,000,000 annually. Cordage, parenthetically, is merely a broad term which includes rope as well as the strands and yarns from which rope is made.

Always at a high level of rope-consciousness, Plymouth Cordage is especially feverish in its dignified New England way these days, because rope is in the midst of something new for just about the first time in the whole history of the material. And that is undoubtedly a long time, because rope goes back to twisted vines that antedate the wheel. This new factor is the introduction for the first time of rope made from synthetic fibers. Heretofore, clear back to the cave man, natural fibers have been the sole raw material of cordage. Hence nylon and other synthetic ropes are something of an earth-shaking twist in the cordage field.

The product, rope, is one of those invisible commonplaces of great importance which no one ever visualizes as separate entities—much like the mailman or the numerals on a clock face. The only really dramatic rope is a broken rope. But Plymouth lives in the pleasant assurance that without rope our civilization would come hopelessly untied.

No one pays any attention to the rope that holds the trolley pole until the trolley comes off the wire and the streetcar stops. On the other hand, everyone marvels at what is just as commonplace, but better dressed—the Hindu rope trick. The Hindu rope trick—and anywhere else it would cost you money to learn this—is strictly phony. When the heathen tosses the frayed end of his rope into the sky or the top of the stage, there is a four-pronged hook in the end, and up there somewhere is a taut piano wire. Hook the piano wire and the rope is perfectly capable of supporting a small boy shinnying up into ostensible nothingness.

The real magic of rope, though, is its work-horse versatility. The same piece of rope will take or save a life, hold a horse or a line of wash, drive a power shaft or help a man climb a mountain. Two lengths of rope which look the same to the layman may differ as greatly as peril and security. The window washer, the steeplejack and painters on high buildings know this better than anyone else.

In most cases, rope is friendly enough to give warning when it is overly abused. Breaking yarns within strands whimper an audible caution as they begin to part, and many a towboat man knows rope by ear as well as by eye. Fraying, of course, is a clearly visible warning. The only really deadly trouble that rope gets into and is silent about is an attack by acid. Acids, therefore, are rigorously taboo in the Plymouth plant, and Plymouth people are convinced that the new synthetic ropes which are acid-resistant are eventually going to capture all uses where rope is responsible for human lives.

Of the three major rope markets—the sea, the farm and industry—the sea somehow manages to cling to about 40 per cent of all rope consumption,

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and the lusty ship chandler of the water front is still one of the most important of all rope outlets. The advent of steam and Diesel on deep water did, it is true, dissipate many traditional jobs for rope, but when tarred-hemp rigging disappeared, rope by no means became a landlubber. A 35,000-ton battleship today is launched with fifty tons of rope aboard. Destroyers run an even higher ratio of rope to size of vessel, for a reason no one has figured out. And the Navy lays claim to the thickest—nine-inch circumference—and longest—1100 feet—nylon rope that has yet been made, a Plymouth lay that was used at a mid-Pacific fueling and arming rendezvous during the war.

Farming is habitually tangled up in rope, from the jug sling that carries the water bottle into the fields all the way to the hay ropes and block-and-fall ropes for barn work. Binder twine, though, which has long been the greatest cordage product on the farm, is on its way out as the combine harvester supplants the old faithful binder. This would be a severe blow to the rope industry if it were not for a strange coincidence—the unrelated rise of pickup hay balers which happens to be building up the use of baler twine as binder twine declines.

Industry is not only shot through with rope and rope uses but contains any view on the importance of rope that you could name. One of the largest railroads in this country apparently looks on rope as a necessary nuisance, since it customarily buys second-grade rope and doesn't bother to identify it as the property of that particular railroad. Other railroads take an opposite view. Cut a piece of Erie Railroad rope, which is first-class rope, and you will find, buried in the strands, a twisted paper thread which says "Erie" along every inch of the rope's length. The Lackawanna and the B. & O. and many other roads use the same sort of concealed marker. The New Haven, on the other hand, has a dyed-yarn identification running through its ropes.

American Steel and Wire not only puts a name marker in the fiber heart of its wire ropes but the marker specifies the grade of wire rope in which it is spun. Such a system is handy when, in case of possible failure, a question arises over whether the user has put the wire rope under an improper strain. Plymouth's laboratory is experimenting with fluorescent marking compounds which can be spun into rope as normally invisible identification markers. Thus, a water-front fight over whose hawser is whose can be settled by calling for the nearest infrared lamp.

This matter of rope identity is one of the woeful aspects of Plymouth's business. They are constantly depressed by the knowledge that a length of rope in use looks just like rope, and the casual onlooker can't tell that the fine Manila lifting that load is their rope. They twist their own Ship Brand marker into their first-quality Manila, and dye the tops of binder-twine balls, but the visible brandlessness of rope in use is a frustrating facet of their business.

This inability to proclaim Plymouth from every length of rope is especially painful to a company with the built-in and long-nurtured pride of The Cordage. The company was founded in 1824 by a sideburned, abolitionist, teetotalist Yankee, Bourne Spooner, who was backed by lawyers and merchants from Boston. The first stock certificate was issued to Caleb Loring. Caleb Loring's grandson, a shrewd, ruddy, amiable Bostonian, Augustus Peabody Loring, is now chairman of the board.

Augustus Peabody Loring looks on Plymouth Cordage with much the same affection and respect that any New Englander would display for the family Bible. He admits, certainly without spilling any secret, that "we are a Boston-bean company all right, and just chuck full of sentiment." Since Loring's stock would go a long way toward control of Plymouth Cordage, he has at times been offered above-market prices for it, which he always turns down with a sort of wondering amusement. Recalling one especially persistent offer, he refers to the would-be buyer as an amazingly unperceiving man. "Why," he says, "that man just couldn't understand that sentiment is not for sale. It actually puzzled him."

Plymouth's first facility was a ropewalk which still stands, shadowy and full of age, among the Cordage buildings. It may have been this very ropewalk which Longfellow described in the poem of that name. A ropewalk was the complete rope factory of its day, a long low building in which men walked backward from a turning wheel, twisting yarns and strands and rope in hands that were unbelievably sensitive to the art of tension. Bourne Spooner—as much through a fortunate purchase

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of fiber as anything else, apparently—got the enterprise off to an immediately successful start and then spent the rest of his life with it. By 1832 the company paid its first dividend to stockholders, and in only three years since has Plymouth failed to make at least a token payment annually.

Employment as Plymouth's top officer is no loose and erratic affair. It is steady work. Bourne Spooner was succeeded by his son, who was succeeded by Gideon Holmes, who was, in turn, succeeded by his son, Francis Holmes. By the time these four had served, a century had passed. Moreover, Francis Holmes, the fourth head of the business, still puts in time at the office, although he dropped the presidency awhile back.

Plymouth's current president, the brisk young Ellis Wethrell Brewster, is just as much bean and Pilgrim as the company itself, since he descends from the Elder Brewster, of Plymouth Colony. A couple of Lowells have figured in Cordage affairs and there is now a Cabot on the board. Yet this is the company whose lariat is pre-eminent among the cowboys of the West, and which stands second to International Harvester in binder-twine sales on wheat fields 2000 miles from Boston.

There is a good, stubborn reason for Plymouth's standing, though, and it traces back to the 1880's and 1890's. First of all, there was, in 1887, a great cordage pool in which all the major cordage companies of the country were associated on a quota basis. Members of the pool who exceeded their allotted production had to pay penalties to the pool. Those who produced less than their quota received cash benefits. It was a morally destructive industrial-dole system for those inclined to be easygoing, and many members took the cash and let the cordage go, shutting up shop and leaning back on their benefits.

Plymouth Cordage, like a good Pilgrim, could hardly yield to this fleshly temptation. Plymouth produced its head off and paid penalty after penalty. Then, when the pool inevitably collapsed, virtue posted the size of its reward. The lazy members were out of business. Plymouth, which had started out as a small company, had about doubled its stature.

Temptation, letting neither saint nor sinner rest, presented itself promptly again, when remnants of the pool got together and established a huge holding company. The holding company wanted to take Plymouth over and offered admittedly sweet-smelling bait. But again the company put the devil behind it. The decision meant a bitter fight, because the cartel immediately tried to drown Plymouth in an ocean of cheap rope. The Pilgrims, though, kept on making their kind until the cartel, with enough rope, hanged itself. And again Plymouth collected its conscientious-behavior reward—it became the country's largest ropemaker.

In the old days, Yankee traders were bound to have an edge in ropemaking, since rope is basically nothing more than twisted fiber, and the fibers almost all come from distant ports with which New England seafarers have been familiar for dozens of decades. Eighty per cent of Plymouth's rope in normal times is *abacá*, the so-called Manila hemp. Next in importance is sisal, from the Indies, Africa and Haiti. Next again is henequen, from Mexico's state of Yucatan, a fiber almost wholly devoted to binder twine. There is a little soft hemp from Europe sometimes, and during the war the banana people of Central America experimented with Manila and did surprisingly well with it—the first time *abacá* has been available in quantity from anywhere but the Philippines.

The fibers, arriving at Plymouth in huge bales, look a good deal like locks from the bobs of big blondes. Combed and lubricated, they are spun into yarns, and the yarns are twisted into strands. Three or more strands are then twisted into rope. In rope terminology, yarns are spun, strands are formed and rope is laid. But if all this twisting were done in one direction, rope would soon unwrap itself and revert to fluffy fibers. The trick, therefore, is to twist yarns one way, strands the opposite way, and rope again the opposite way, all with a mathematical precision that neutralizes the uncoiling tendency and leaves the rope balanced.

In bad or abused rope the strands kink—get "gouty"—or slacken off—get "long-jawed." Sometimes abuse cannot be helped, and special lays are necessary. Plymouth has a patented lay which is essentially an inner group of yarns covered by a blanket of fiber and one or more layers of yarn laid on top. It has a hollow rope full of lead pellets which drops dead and lies where

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it falls. It has a patented ski-tow rope invented to overcome a pernicious habit on the country's ski runs. It seems that ordinary rope is capable of opening its strands a little and then closing them under a slightly different strain. Embarrassed skiers sometimes found that the little bite was enough to grab clothing, and naturally a skier with his or her sweater just plucked off and carried up a snowy hill takes a cold view of the situation. The new ski-tow rope, in effect, won't bite or disrobe honest sportsmen.

A piece of old rope lying around somewhere is doubtless the least awe-inspiring thing in the world, ranking down with a dead leaf, but the spectacle of heavy rope being laid by high-speed machinery is very far in the opposite direction. New rope is vividly patterned, highly decorative stuff. To see it being extruded from ponderous, thundering machines, whirling in rapid arcs, is roughly like seeing a tan-and-cream rainbow coming out of a storm center.

That, however, is only in the mills. Down at the poky old ropewalk, where special jobs are usually undertaken, things are quite different. The ropewalk is as quiet and seemingly bare as a string of empty bowling alleys. Movement is slow. Little carts inch along the 1200-foot polished walks, moved entirely by the pressure of strands twisting behind a slowly turning polished-steel spindle. Men stroll along with the little wagon, tending the strands before it and the newborn rope behind it. Of this little group, the ropemaker himself is absolute king. With wise hands he literally feels the new rope into being, adjusting the twist by the tiny variations in tension which only he can recognize.

The ropewalk customarily gets to make the very large ropes, and it was the ropewalk that made Plymouth's largest product, a cable for a Chilean harbor. Seven hundred feet long, it was twenty-one inches in circumference and required three railroad flatcars to carry it away. Every inch of the cable weighed approximately a pound. Cables are ropes in which each strand is a complete rope itself.

The war plunged Plymouth deep into the synthetic-rope business. With the Philippines shut off, the Government immediately took control of Manila and other rope fibers, and spurred the production of synthetics, chiefly nylon. Happily, nylon was a huge success, once the ropemakers had become familiar with the lays necessary to harness it properly to war jobs. Such things as parachute lines, glider towlines and scaling ropes for mountain troops fell into the nylon bag. Hence, when the war ended there was a backlog of experience in the new ropes which shot them directly into civilian uses. Cowboys, who require an almost board-stiff lay and moisture resistance in lariats, are gladly paying fifty cents a foot for nylon dogie trappers. Mountain-climbing clubs moved right in on the same nylon ropes that combat troops carried, and window washers, yachtsmen and painters are trying out the synthetic.

The most eccentric product in the synthetic field thus far is undrawn nylon rope, which can be laid to stand a predetermined load without stretching. Then, when that load limit is passed, zing, the rope stretches three to four times its original length. It is a solo performance, for the fibers can't snap back again, but the product, developed by Plymouth in conjunction with an aviation company, is already staked out for use as a safety brake, and was described in the article Air Accidents Don't Have to be Fatal, in the Post for September 7, 1946.

In 1945, Plymouth placed three sixty-fathom nylon foregoers—harpoon rope—with the Norwegian whaling fleet operating in Antarctic waters. One of the three was caught in a propeller and lost. A second was used by Harpoonist Lorens Hasberg, and the third by Harpoonist Krog Anderson. Lorens caught fourteen whales and Krog caught ten. Lorens, reporting in 1946 when the fleet returned, said the nylon foregoer satisfied him, and he thought each one would be good for fifteen whales, always excluding loss from the heeling-over of a harpooned whale. Krog said that what Lorens said was about right with him too. As a result, this year the whalers took 220 such lines into the Antarctic, and there is a good chance that nylon henceforth will be quite at home in the southern icefloes.

Other synthetic ropes will probably blossom from the Plymouth laboratory, where fibers go through a dreadful inquisition of strain and mauling and acid attacks, but however sensational they may be, they will have a hard time equaling the inheritance that old ropes have left us. We owe incalculable debts to the deep-water sailor of one and two centuries ago whose talents were accurately described by the enduring phrase—"he knows the ropes." He worked with rope, wrote poetry with rope, painted pictures with rope, and dwelt in a tight little culture of rope. He was unlearned. He had no books, no typewriter, no radio or movies. But he did have leisure hours on months-long voyages, and he had rope. From this he built and handed down the bulk of rope artisanship that exists today. If his era had passed without him and his gifts, dozens of occupations now would have had to sweat out knowledge that, as it is, was freely handed down. He hitched, he lashed, he knotted, tied and spliced. He even crocheted and sewed and tatted.

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Consider how useless rope is unless it is fastened to its work, and you have the importance of knotting, splicing, hitching—as important as the rope itself. And it is an insult to the seafarers of all time that while any present-day child can tie a knot, the most often tied is a weak, easily jammed, despised thing called a granny.

Boy and Girl Scouts can do better than that, of course—a fact that no one knows better than Plymouth Cordage. Plymouth distributes a booklet of elementary knots and fastenings, and it is a poor week that does not see a Scout demand for a couple of thousand copies. The inference is good. At least that many youngsters are trying to rise above the national granny-knot level and are associating with bowlines, sheepshanks, catspaws and possibly even selvagee straps.

Few today possess any appreciable part of the rope knowledge that an able seaman of 1800 possessed. But civilization, it was proved in 1944, has not dropped to an absolute low, for in that year there was published one of the most fascinating and refreshing volumes of this era, The Ashley Book of Knots, by Clifford W. Ashley. You think the tying of knots is a slight and shallow hobby, occasionally useful, but definitely limited? Then consider this: Ashley spent forty years pursuing his material and eleven years compiling his book. It contains 3900 knots pictured in 7000 illustrations.

Swing an arm anywhere within the Plymouth offices and the chances are fair that you will hit a graduate of MIT, a Boston accent, and a man who either owns or sails a boat, who can worm, parcel and serve a line, and who knows 100 knots. But it is doubtful that all the Plymouth men together know 3900 knots. Obviously a remarkable man, Mr. Ashley.

Ashley can tie and has tied a Washington-to-Norfolk-boat-heaving-line knot. He can put in an Admiral-the-Honorable-Sir-George-Elliot's-eye. He can put in a mouse-and-collar. He can make a goose-boot-and-hobble or tie a double-oysterman's-stopper or plat a solid sennit.

It is discouraging to learn that a true-lover's knot is merely a couple of overhand knots drawn together, and is otherwise known as a fisherman's loop. It is threatening to discover that the hangman's knot is not necessarily the one destined to go under the left ear in the event of capital punishment. There are five other knots that serve the lethal purpose, including the scaffold, the gallows, the Newgate, the Ichabod and the gibbet.

Plymouth, although the company never has any direct association with rope's grimmest chore, once received a length of rope from the hangman of a Northeastern state who had forgotten, undoubtedly due to poor business, how to tie a hangman's knot. The company sent it back rather nervously, and explained that they just made rope; they didn't fabricate devices from it. However, if he would follow the enclosed sketch ——

The Cordage gets along without blazoning its business in the town's eye and, in fact, Plymouth is no more full of rope than any other comparable town. The older Cordage buildings are just ivy-covered buildings, without rope latches on the doors or rope fences around them or advertising signs done in rope characters. In town, the hardware dealer has no rope in the window. Rope makes some excellent and pleasing modern furniture, but in Plymouth the furniture store displays only aluminum, wood and overstuffed pieces.

The only ropewise ostentation Plymouth indulges in around its home community is the traditional tug-of-war by employees when there is an occasion for games and speeches and celebration. In the case of a centenarian like Plymouth Cordage, anniversaries and other celebrations can be thought up without difficulty, and these are the times when a length of Plymouth's shiniest, toughest, best-lubricated Ship Brand Manila is brought out on the green lawn for a tugging contest that will absolutely not break the rope.

In rope's daily life, though, it is less apt to play games than to be cast in an indispensable and often critical role. But it never gets the spotlight or its name on the marquee. The Plymouth people are not completely resigned to this facelessness, and frequently wish the rope industry could introduce new models every year and have a big show and display rope in hotel lobbies banked with flowers. It never happens, so they take solace in knowing that their product is in there pitching in a pinch, sending a breeches buoy to a breaking ship, hoisting an injured person from some dangerous depth, bridging a chasm or otherwise playing a useful part in emergencies. But thus far, as we have seen, this does not include the emergency of back-scratching.

THE END